

## Exploring Surface Tension through the Scientific Method

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Table Role: \_\_\_\_\_ Section: \_\_\_\_\_

### Background

Surface tension is one of water's most important properties. It is the reason that water collects in drops, but it is also why water can travel up a plant stem, or get to your cells through the smallest blood vessels. You can experiment with surface tension using just a few household items. Surface tension creates the 'skin' on top of the water, but it is also what causes water to stick together in drops.

### Activity 1

Observe how drops stick together by experimenting with water and a penny.

#### Materials:

cup of water  
a penny  
medicine dropper

#### What to do:

1. First make a prediction: how many drops of water do you think you can fit on the top surface of the penny?

\_\_\_\_\_

2. Add one drop. After seeing how much room it takes, do you want to rethink your first prediction?

\_\_\_\_\_

Now continue carefully adding drops until the water spills off the penny. Try this three times, recording the number of drops each time, and then find the average number of drops that can fit.

Trial 1: \_\_\_\_\_ Trial 2: \_\_\_\_\_ Trial 3: \_\_\_\_\_ Ave. \_\_\_\_\_

Surface tension is the reason you can fit so much water on the penny. The water molecules attract each other, pulling together so the water doesn't spill. Predict how many drops you can fit on a nickel compared with the penny.

Prediction of Nickel: \_\_\_\_\_

Trial 1: \_\_\_\_\_ Trial 2: \_\_\_\_\_ Trial 3: \_\_\_\_\_ Ave. \_\_\_\_\_

Which held more drops, Nickel or Penny? Why do you think that is?

## Activity 2:

### Materials:

Cup of water  
3 Paperclips

### What You Do:

- 1 Start with a cup of water and some paperclips. Do you think a paperclip will float in the water?

Drop one in the cup to find out. What did the paperclip do and why?

- 2 Instead of dropping the paperclip into the cup, gently lay it flat on the surface of the water. (This is tricky — it may help to place a piece of paper towel slightly bigger than the paperclip in the water. Then lay the paperclip on top of it. In a minute or so, the paper towel will sink, leaving the paperclip floating on top of the water.) What happens and why?

- 3 Now put a drop of dish soap in the water. This will bind with the water molecules, interfering with the surface tension. The paper clip will sink.

### Analysis:

Explain in a paragraph what happened to the surface tension when you add dish soap, in **your own words**.